



#15

SEQUENCE LISTING

<110> Liu, et al.

<120> Screens and Assays for Agents Useful in Controlling
Parasitic Nematodes

<130> 2002630-0012

<140> 10/051,644

<141> 2002-01-18

<160> 8

<170> PatentIn Ver. 2.1

<210> 1

<211> 425

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:VAP-1 Amino
Acid Sequence

<400> 1

Met Ala Val Leu Ala Val Val Leu Leu Leu Ala Cys Leu Glu Arg Ala
1 5 10 15Val Ala Gln Thr Phe Gly Cys Ser Asn Thr Lys Ile Asn Asp Gln Ala
20 25 30Arg Lys Met Phe Tyr Asp Ala His Asn Asp Ala Arg Arg Ser Met Ala
35 40 45Lys Gly Leu Glu Pro Asn Lys Cys Gly Leu Leu Ser Gly Gly Lys Asn
50 55 60Val Tyr Glu Leu Asn Trp Asp Cys Glu Met Glu Ala Lys Ala Gln Glu
65 70 75 80Trp Ala Asp Gly Cys Pro Ser Ser Phe Gln Thr Phe Asp Pro Thr Trp
85 90 95Gly Gln Asn Tyr Ala Thr Tyr Met Gly Ser Ile Ala Asp Pro Leu Pro
100 105 110

Tyr Ala Ser Met Ala Val Asn Gly Trp Trp Ser Glu Ile Arg Thr Val

115	120	125
Gly Leu Thr Asp Pro Asp Asn Lys Tyr Thr Asn Ser Ala Met Phe Arg		
130	135	140
Phe Ala Asn Met Ala Asn Gly Lys Ala Ser Ala Phe Gly Cys Ala Tyr		
145	150	155
Ala Leu Cys Ala Gly Lys Leu Ser Ile Asn Cys Ile Tyr Asn Lys Ile		
165	170	175
Gly Tyr Met Thr Asn Ala Ile Ile Tyr Glu Lys Gly Asp Ala Cys Thr		
180	185	190
Ser Asp Ala Glu Cys Thr Thr Tyr Ser Asp Ser Gln Cys Lys Asn Gly		
195	200	205
Leu Cys Tyr Lys Ala Pro Gln Ala Pro Val Val Glu Thr Phe Thr Met		
210	215	220
Cys Pro Ser Val Thr Asp Gln Ser Asp Gln Ala Arg Gln Asn Phe Leu		
225	230	235
Asp Thr His Asn Lys Leu Arg Thr Ser Leu Ala Lys Gly Leu Glu Ala		
245	250	255
Asp Gly Ile Ala Ala Gly Ala Phe Ala Pro Met Ala Lys Gln Met Pro		
260	265	270
Lys Leu Val Lys Tyr Ser Cys Thr Val Glu Ala Asn Ala Arg Thr Trp		
275	280	285
Ala Lys Gly Cys Leu Tyr Gln His Ser Thr Ser Ala Gln Arg Pro Gly		
290	295	300
Leu Gly Glu Asn Leu Tyr Met Ile Ser Ile Asn Asn Met Pro Lys Ile		
305	310	315
Gln Thr Ala Glu Asp Ser Ser Lys Ala Trp Trp Ser Glu Leu Lys Asp		
325	330	335
Phe Gly Val Gly Ser Asp Asn Ile Leu Thr Gln Ala Val Phe Asp Arg		
340	345	350
Gly Val Gly His Tyr Thr Gln Met Ala Trp Glu Gly Thr Thr Glu Ile		
355	360	365
Gly Cys Phe Val Glu Asn Cys Pro Thr Phe Thr Tyr Ser Val Cys Gln		

370 375 380
 Tyr Gly Pro Ala Gly Asn Tyr Met Asn Gln Leu Ile Tyr Thr Lys Gly
 385 390 395 400
 Ser Pro Cys Thr Ala Asp Ala Asp Cys Pro Gly Thr Gln Thr Cys Ser
 405 410 415
 Val Ala Glu Ala Leu Cys Val Ile Pro
 420 425

<210> 2
 <211> 1341
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence:VAP-1 cDNA
 Nucleotide Sequence

<400> 2
 atggcgggtat tagcagtggt actacttcta gcatgcctgg agagagcggg tgcacagacg 60
 ttcggtcgtc ctaacaccaa gatcaatgac caggctcgta agatgttcta tgatgctcac 120
 aatgatgcaa gacgaagcat ggctaaaggg cttgagccaa acaagtgcgg actcttatct 180
 ggtggaaaga atgtttatga attgaattgg gattgcgaga tggaagcaaa agctcaggaa 240
 tgggcagacg gatgtcccag ctctttccag acatttgatc caacatgggg gcagaactac 300
 gcgacgtaca tgggatcgat tgctgatccg cttccatacg cttccatggc tgtaaatggg 360
 tggtggtcgg aaattagaac cgtaggactt acggatcctg ataacaagta cactaacagt 420
 gcaatgttcc gatttgctaa tatggcaaat ggtaaagctt cagcttttgg atgtgcatac 480
 gcgttggtcg caggaaaact atccatcaat tgcatttaca acaagatagg atacatgacc 540
 aatgctatca tttatgaaaa aggagatgcc tgtaccagtg acgctgaatg caccacctac 600
 tcagactcac aatgcaaaaa cgggtctttgc tataaggcac ctcaagctcc agtcgttgag 660
 actttcacia tgtgcccttc ggtcacggac cagtcggatc aggcgcgtca aaacttcttg 720
 gacacccata acaaattgcg tacaagcctt gccaaaggac ttgaagctga tggaattgcc 780
 gctggagcat ttgcaccaat ggccaagcaa atgccaaaac tggtaaaata cagctgcaca 840
 gttgaagcaa acgccagaac atgggcaaaa ggatgccttt accagcattc aacaagcgca 900
 cagagaccag gactcgggtg aaatctttat atgacagca ttaacaacat gcctaaaatt 960
 caaacgcggg aggactcctc aaaggcttgg tggccgagt tgaaagactt cggagtcggg 1020
 tctgacaaca ttctgaccca agcagttttt gatcgtggcg ttggacatta cacacaaatg 1080
 gcatgggaag gaactactga aattggatgt tttgtggaga attgtccaac attcacttat 1140
 tccgtatgcc aatatggtcc agcgggaaac tacatgaacc aactaatcta taccaagggc 1200
 tcaccatgca cagctgacgc cgattgcca ggaaccaga catgcagtgt cgctgaagca 1260
 ttatgtgtta tcccttagta aattttctat gcaactctt gaaagtcata ataaatatgc 1320
 aaaaattaaa aaaaaaaaaa a 1341

<210> 3

<211> 473

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:VAP-2 Amino
Acid Sequence

<400> 3

Met Asn Val Val Leu Ser Ala Val Thr Leu Phe Leu Ile Phe Arg Tyr
1 5 10 15

Ala Gln Thr Val Asn Ile Glu Gly Ser Gly Gly Asn Asp Glu Leu Leu
20 25 30

Glu Gln Asn Val Trp Asn Asp Val Asp Asp Lys Val Val Glu Ala Leu
35 40 45

Gly Gly Leu Asp Asp Glu Leu Leu Thr Glu His Val Cys Asn Lys Ser
50 55 60

Thr Ile Thr Gln Leu Gln Gln Glu Ile Ile Leu Thr Thr His Asn Glu
65 70 75 80

Leu Arg Arg Ser Leu Ala Phe Gly Lys Gln Arg Asn Lys Arg Gly Leu
85 90 95

Met Asn Gly Ala Arg Asn Met Tyr Lys Leu Asp Trp Asp Cys Glu Leu
100 105 110

Ala Ser Leu Ala Ala Asn Trp Ser Thr Ser Cys Pro Gln His Phe Met
115 120 125

Pro Gln Ser Val Leu Gly Ser Asn Ala Gln Leu Phe Lys Arg Phe Tyr
130 135 140

Phe Tyr Phe Asp Gly His Asp Ser Thr Val His Met Arg Asn Ala Met
145 150 155 160

Lys Tyr Trp Trp Gln Gln Gly Glu Glu Lys Gly Asn Glu Asp Gln Lys
165 170 175

Asn Arg Phe Tyr Ala Arg Arg Asn Tyr Phe Gly Trp Ala Asn Met Ala
180 185 190

Lys Gly Lys Thr Tyr Arg Val Gly Cys Ser Tyr Ile Met Cys Gly Asp
195 200 205

Gly Glu Ser Ala Leu Phe Thr Cys Leu Tyr Asn Glu Lys Ala Gln Cys
 210 215 220

Glu Lys Glu Met Ile Tyr Glu Asn Gly Lys Pro Cys Cys Glu Asp Lys
 225 230 235 240

Asp Cys Phe Thr Tyr Pro Gly Ser Lys Cys Leu Val Pro Glu Gly Leu
 245 250 255

Cys Gln Ala Pro Ser Met Val Lys Asp Asp Gly Gly Ser Phe Gln Cys
 260 265 270

Asp Asn Ser Leu Val Ser Asp Val Thr Arg Asn Phe Thr Leu Glu Gln
 275 280 285

His Asn Phe Tyr Arg Ser Arg Leu Ala Lys Gly Phe Glu Trp Asn Gly
 290 295 300

Glu Thr Asn Thr Ser Gln Pro Lys Ala Ser Gln Met Ile Lys Met Glu
 305 310 315 320

Tyr Asp Cys Met Leu Glu Arg Phe Ala Gln Asn Trp Ala Asn Asn Cys
 325 330 335

Val Phe Ala His Ser Ala His Tyr Glu Arg Pro Asn Gln Gly Gln Asn
 340 345 350

Leu Tyr Met Ser Ser Phe Ser Asn Pro Asp Pro Arg Ser Leu Ile His
 355 360 365

Thr Ala Val Glu Lys Trp Trp Gln Glu Leu Glu Glu Phe Gly Thr Pro
 370 375 380

Ile Asp Asn Val Leu Thr Pro Glu Leu Trp Asp Leu Lys Gly Lys Ala
 385 390 395 400

Ile Gly His Tyr Thr Gln Met Ala Trp Asp Arg Thr Tyr Arg Leu Gly
 405 410 415

Cys Gly Ile Ala Asn Cys Pro Lys Met Ser Tyr Val Val Cys His Tyr
 420 425 430

Gly Pro Ala Gly Asn Arg Lys Asn Asn Lys Ile Tyr Glu Ile Gly Asp
 435 440 445

Pro Cys Glu Val Asp Asp Asp Cys Pro Ile Gly Thr Asp Cys Glu Lys
 450 455 460

Thr Thr Ser Leu Cys Val Ile Ser Lys
465 470

<210> 4
<211> 1422
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:VAP-2 cDNA
Nucleotide Sequence

<400> 4
atgaacgtgg tcctttccgc tgtcactctt tttcttattt ttcgatatgc gcagactgtg 60
aatatagaag gcagtggagg aaatgatgag cttcttgagc agaacgtgtg gaacgatgta 120
gacgacaagg ttgtagaagc acttggtggt cttgatgatg aactgctaac cgaacatgtg 180
tgtaacaaat caacgatcac tcagctacag caggagatca tcttgacaac ccacaatgaa 240
ttacgaagat cattggcttt cygaaagcaa agaaacaaga gaggtctcat gaacggtgcg 300
agaaatatgt ataaactgga ttgggattgt gaactggcat cacttgcagc caattggtca 360
acctcctgcc ctcagcactt tatgccgcaa tcggtacttg gctccaacgc tcagcttttt 420
aagcgtttct atttttattt tgatgggcac gactctactg tacatatgcg aaacgcgatg 480
aagtattggt ggcagcaagg tgaagaaaaa ggcaatgagg atcagaaaaa tagattctat 540
gccagacgaa attattttgg atgggcaaac atggcaaaag gaaaaacata tcgagttgga 600
tgctcgtata ttatgtgctg cgacggtgaa tctgcacttt tcaattgtct ttataacgaa 660
aaagcccaat gcgaaaaaga aatgatttac gaaaatggaa aacctgctg tgaggataaa 720
gactgtttca catatccagg atcaaaatgt ttagtacctg aaggattatg tcaagcacct 780
tctatggtaa aggatgatgg aggaagtttc caatgtgata actcccttgt gtcagatgtc 840
accgcaatt tcacttttga gcaacacaat ttttatagat ctctcttgc aaaagggttt 900
gaatggaatg gagaaacaaa cacttcccag ccaaaggcta gtcaaagat caaaatggag 960
tatgactgca tggttgaacg gtttgcacaa aactgggcaa ataattgctg ttttgcacac 1020
tcggcaccatt acgaaagacc gaatcagggt cagaatctct acatgagttc tttctcaaac 1080
cctgatccta gaagccttat acatacggcc gtcgagaagt ggtggcagga attggaggag 1140
ttcggctact caattgataa cgttctgaca cccgaattgt gggatttgaa agggaaagcg 1200
ataggacatt acactcagat ggcctgggat cgtacttacc gtcttggttg tggaatcgca 1260
aactgtccga agatgtcgta cgtggtttgt cactatgggc cagcaggcaa cagaaagaac 1320
aataaaatct atgaaatcgg ggatccttgc gaagtcgatg atgattgccc gattggaaca 1380
gattgtgaaa agacaacttc tttatgtgtg atctcaaaat aa 1422

<210> 5
<211> 218
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:Clustal W
Alignment of VAP-1, VAP-2, and Selected Other

Nematode VA Proteins.

<400> 5

Met Phe Ser Pro Val Ile Val Ser Val Ile Phe Thr Ile Ala Phe Cys
1 5 10 15

Asp Ala Ser Pro Ala Arg Asp Gly Phe Gly Cys Ser Asn Ser Gly Ile
20 25 30

Thr Asp Lys Asp Arg Gln Ala Phe Leu Asp Phe His Asn Asn Ala Arg
35 40 45

Arg Arg Val Ala Lys Gly Val Glu Asp Ser Asn Ser Gly Lys Leu Asn
50 55 60

Pro Ala Lys Asn Met Tyr Lys Leu Ser Trp Asp Cys Ala Met Glu Gln
65 70 75 80

Gln Leu Gln Asp Ala Ile Gln Ser Cys Pro Ser Ala Phe Ala Gly Ile
85 90 95

Gln Gly Val Ala Gln Asn Val Met Ser Trp Ser Ser Ser Gly Gly Phe
100 105 110

Pro Asp Pro Ser Val Lys Ile Glu Gln Thr Leu Ser Gly Trp Trp Ser
115 120 125

Gly Ala Lys Lys Asn Gly Val Gly Pro Asp Asn Lys Tyr Asn Gly Gly
130 135 140

Gly Leu Phe Ala Phe Ser Asn Met Val Tyr Ser Glu Thr Thr Lys Leu
145 150 155 160

Gly Cys Ala Tyr Lys Val Cys Gly Thr Lys Leu Ala Val Ser Cys Ile
165 170 175

Tyr Asn Gly Val Gly Tyr Ile Thr Asn Gln Pro Met Trp Glu Thr Gly
180 185 190

Gln Ala Cys Lys Thr Gly Ala Asp Cys Ser Thr Tyr Lys Asn Ser Gly
195 200 205

Cys Glu Asp Gly Leu Cys Thr Lys Gly Pro
210 215

<210> 6

<211> 205

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:Clustal W
Alignment of VAP-1, VAP-2, and selected other
nematode VA Proteins.

<400> 6

```
Asp Val Pro Glu Thr Asn Gln Gln Cys Pro Ser Asn Thr Gly Met Thr
 1             5             10             15

Asp Ser Val Arg Asp Thr Phe Leu Val His Asn Glu Phe Arg Ser Ser
      20             25             30

Val Ala Arg Gly Leu Glu Pro Asp Ala Leu Gly Gly Asn Ala Pro Lys
      35             40             45

Ala Ala Lys Met Leu Lys Met Val Tyr Asp Cys Glu Val Glu Ala Ser
      50             55             60

Ala Ile Arg His Gly Asn Lys Cys Val Tyr Gln His Ser His Gly Glu
      65             70             75             80

Asp Arg Pro Gly Leu Gly Glu Asn Ile Tyr Lys Thr Ser Val Leu Lys
      85             90             95

Phe Asp Lys Asn Lys Ala Ala Lys Gln Ala Ser Gln Leu Trp Trp Asn
      100            105            110

Glu Leu Lys Glu Phe Gly Val Gly Pro Ser Asn Val Leu Thr Thr Ala
      115            120            125

Leu Trp Asn Arg Pro Gly Met Gln Ile Gly His Tyr Thr Gln Met Ala
      130            135            140

Trp Asp Thr Thr Tyr Lys Leu Gly Cys Ala Val Val Phe Cys Asn Asp
      145            150            155            160

Phe Thr Phe Gly Val Cys Gln Tyr Gly Pro Gly Gly Asn Tyr Met Gly
      165            170            175

His Val Ile Tyr Thr Met Gly Gln Pro Cys Ser Gln Cys Ser Pro Gly
      180            185            190

Ala Thr Cys Ser Val Thr Glu Gly Leu Cys Ser Ala Pro
      195            200            205
```


<210> 7

<211> 207

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:Clustal W
Alignment of VAP-1, VAP-2, and selected other
nematode VA proteins.

<400> 7

Met Asn Tyr Leu Leu Leu Val Val Ala Leu Ala Val Gly Cys Ser Ala
1 5 10 15

Asp Phe Gly Ser Ser Gly Gln Asn Gly Ile Ile Asn Ala His Asn Thr
20 25 30

Leu Arg Ser Lys Ile Ala Lys Gly Thr Tyr Val Ala Lys Gly Thr Gln
35 40 45

Lys Ser Pro Gly Thr Asn Leu Leu Lys Met Lys Trp Asp Ser Ala Val
50 55 60

Ala Ala Ser Ala Gln Asn Tyr Ala Asn Gly Cys Pro Thr Gly His Ser
65 70 75 80

Gly Asp Ala Gly Leu Gly Glu Asn Leu Tyr Trp Tyr Trp Thr Ser Gly
85 90 95

Ser Leu Gly Asp Leu Asn Gln Tyr Gly Ser Ala Ala Ser Ala Ser Trp
100 105 110

Glu Lys Glu Phe Gln Asp Tyr Gly Trp Lys Ser Asn Leu Met Thr Ile
115 120 125

Asp Leu Phe Asn Thr Gly Ile Gly His Ala Thr Gln Met Ala Trp Ala
130 135 140

Lys Ser Asn Leu Ile Gly Cys Gly Val Lys Asp Cys Gly Arg Asp Ser
145 150 155 160

Asn Gly Leu Asn Lys Val Thr Val Val Cys Gln Tyr Lys Pro Gln Gly
165 170 175

Asn Phe Ile Asn Gln Tyr Ile Tyr Val Ser Gly Ala Thr Cys Ser Gly
180 185 190

Cys Pro Ser Gly Thr Ser Cys Glu Thr Ser Thr Gly Leu Cys Val
 195 200 205

<210> 8
 <211> 231
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence:Clustal W
 Alignment of VAP-1, VAP-2, and selected other
 nematode VA proteins.

<400> 8
 Met Ser Asn Lys Leu Ile Ile Ser Ile Leu Ile Leu Thr Ile Ile Tyr
 1 5 10 15
 Thr Val Val Asn Ser Leu Thr Val Pro Glu Gln Asn Ala Val Val Asp
 20 25 30
 Cys Ile Asn Lys Tyr Arg Ser Gln Leu Ala Asn Gly Lys Thr Lys Asn
 35 40 45
 Lys Asn Gly Gly Asn Phe Pro Ser Gly Lys Asp Ile Leu Glu Val Ser
 50 55 60
 Tyr Ser Lys Asp Leu Glu Lys Ser Ala Gln Arg Trp Ala Asn Lys Cys
 65 70 75 80
 Ile Phe Asp His Asn Gly Thr Asp Leu Tyr Ser Gly Gly Lys Phe Tyr
 85 90 95
 Gly Glu Asn Leu Tyr Leu Asp Gly Asp Phe Glu His Lys Asn Ile Thr
 100 105 110
 Gln Leu Met Ile Asp Ala Cys Asn Ala Trp Trp Gly Glu Ser Thr Thr
 115 120 125
 Asp Gly Val Pro Pro Ser Trp Ile Asn Asn Phe Leu Pro Thr Asp Asn
 130 135 140
 Lys Glu Asn Asp Glu Lys Phe Glu Ala Val Gly His Trp Thr Gln Met
 145 150 155 160
 Ala Trp Ala Lys Thr Tyr Gln Ile Gly Cys Ala Leu Lys Val Cys His
 165 170 175

Lys Pro Asp Cys Asn Gly Asn Leu Ile Asp Cys Arg Tyr Tyr Pro Gly
180 185 190

Gly Asn Gly Met Gly Ser Pro Ile Tyr Gln Gln Gly Lys Pro Ala Ser
195 200 205

Gly Cys Gly Lys Ala Gly Pro Ser Thr Lys Tyr Ser Gly Leu Cys Lys
210 215 220

Pro Asp Pro His Gln Asn Asn
225 230